

Available online at www.sciencedirect.com**ScienceDirect**

Procedia - Social and Behavioral Sciences 154 (2014) 64 – 71

Procedia
Social and Behavioral SciencesTHE XXV ANNUAL INTERNATIONAL ACADEMIC CONFERENCE, LANGUAGE AND
CULTURE, 20-22 October 2014

Exploring the Possibilities of the Cognitive Approach for Non-linguistic EFL Students Teaching

Olga A. Obdalova*

National Research Tomsk State University, Tomsk, 36, Lenin Ave., 634050, Russia

Abstract

In this paper, we outline research observations concerning EFL teaching research at the university level through the theoretical lens of the cognitive approach. We show how an integrated cognitive and communicative teaching model can help resolve linguistic and content knowledge gaps, identified in the recent survey of non-linguistic students. Then, we present an illustrative case study from Tomsk State University, which suggests a teaching model with the focus on the development of cognitive and communicative skills in learners. Finally, we offer some recommendations for future research at the intersection of cognitive linguistics and pedagogy.

© 2014 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Peer-review under responsibility of National Research Tomsk State University.

Keywords: Cognitive-communicative approach; non-linguistic students; EFL teaching; topic-related vocabulary acquisition

1. Introduction

In current educational conditions in the Russian Federation the methodology of teaching English to university students of non-linguistic departments is characterized by the supremacy of the communicative approach. According to this approach, language and its analysis are connected mainly with speech production. This approach deals with the modeling of the teaching and learning situations in accordance with the rules of real-life communication, typical of the English speaking world. Although the communicative approach pays due attention to the learners' actual needs, advocates using the functionally appropriate language, focuses on the communicative skills, and enhances the learners' communicative ability, today it may not be sufficient to meet the new requirements of the globalized society. Nowadays new approaches to language teaching, or rather their fusion, are coming to the fore. A shift has

* Corresponding author. Tel.: +7-3822-52-76-46; fax: +7-382-2-52-97-42.

E-mail address: O.Obdalova@mail.ru

been made towards greater attention on the learning process itself, closer integration with the subject and the language, linguistic competence and professional expertise.

The common core of the new challenges for TFL (Teaching a Foreign Language) at any modern university brought about by the quickening pace of globalization and the increasing prominence of languages for effective communication worldwide is knowing how to model a language course into the educational environment. In this way students' skills in a foreign language grow in a way that enhances their education, language and personal development and matches their general field of expertise; how to design and apply teaching materials and tasks (English for Science students, 2011); what relevant resources to choose that improve the learners' ability to interact with people in a foreign language. Nowadays for university students of all specialties it is very important that the content of TFL includes related themes and problems, and is aimed at the development of not only different types of knowledge but also some specific target skills, by means of conscious learning. Specialists in language teaching generally accept the high potential of cognitive linguistics for the creation of the learning environment of that type. The cognitive approach emphasizes meaningful learning and meaningful practice on the basis of comprehending the linguistic knowledge and rules (Boers & Lindstromberg, 2008). The fundamental idea of the cognitive approach nowadays is that the learning process should be aimed at acquiring or rather inferring knowledge, structuring and systematically arranging its units, storing and applying them.

1.1. Aim and research questions

This area of research is chosen because of the lack of teaching strategies allowing teachers for organizing educational conditions to help non-linguistic students develop not only their communicative skills, but also the so-called '21st Century Skills', namely: 1) global awareness, 2) communication and collaboration, 3) critical thinking and problem solving, 4) flexibility and adaptability, 5) social and cross-cultural skills, 6) self-direction and initiative, which are multi-dimensional and require a multidisciplinary approach. In order to design an integrated communicative and cognitive teaching model, the study focuses on exploring the possibilities of the cognitive approach to enhance conventional EFL teaching to Science Faculty students.

The goal of this paper is to investigate potential advantages of applying cognitive-communicative pedagogical model to the teaching of English as a foreign language to Physics majors.

As a result, we have formulated the following research questions for the study:

- How does a cognitive-communicative pedagogical model of EFL teaching change students' topic-related vocabulary acquisition?
- How does the designed EFL model of teaching with the focus on cognitive operations with topic-related materials enhance the capacity of non-linguistic majors to perform communicative tasks in English more successfully?

2. Methodology

2.1. The learning environment

To meet the challenges of fast-paced world society and demands of the professional community, it is necessary to equip students with relevant abilities and competencies, especially communicative and cognitive skills, which enable their holders to get ahead in their professional development and achieve successful careers. This research learning environment is created by means of modeling linguistic and pedagogical environmental setting for EFL acquisition by non-linguistic science faculty students. We suggest that its effectiveness depends on the teacher's mastery to create enough exposure to the target language and to apply relevant theoretical basis to ensure that learners develop the target knowledge and skills, and furthermore and on the learner's engagement in communicative language practice. Nowadays new approaches to language teaching, or rather their fusion, "seek to capture the rich view of language and language learning" (Richards, 2006, p. 24). A shift is made towards greater

attention to the learning process itself, closer integration of the subject and the language, linguistic competence and professional expertise.

Current CLT seeks to meet the demands of different target groups of learners and their professional environment. To improve teaching under new societal conditions a synthesis of the communicative and cognitive paradigms is needed. With respect to the EFL and ESP university contexts, an integrative communicative and cognitive approach tends to bridge the gap between these two major teaching strategies. Their integration deals with not only conscious building linguistic knowledge about the target language by the learners, but also with acquiring and systemizing content-related knowledge in the academic and subject area and with its relevant application to communicative situations (Obdalova & Minakova, 2013). The connection of the processes of cognition and communication is supported by the fact that generation and storage of information are done in accordance with the work of cognitive mechanisms, but its transfer relies on the conformity with the laws of communication. In this case we implement combinatorial creativity when the learners consciously use formulaic language (Kecskes, 2010) and topic-related vocabulary to achieve the goal of communication. Kecskes argues: “When language is used for communication it usually works with meaning units that are qualitatively and quantitatively more complex than sentences: oral or written texts or discourse. Creativity in the production of these higher level units can be regarded as an interplay of grammatical rules, functional adequacy, situational appropriateness, stylistic preference, and norms of use.” (Kecskes, 2014, p. 107).

Thus, the major focus of communicative approach on language awareness, communicative competence, language skills, speech fluency, and correctness of speech (accuracy), language richness and diversity, deductive way of teaching is well supplemented by the cognitive approach, centering on metalinguistic awareness, cognitive competence, knowledge structuring skills, conceptual fluency, appropriateness of the used language, pragmatic adequacy, and inductive techniques. The emergence of new learning environment deals with the introduction of pedagogical technologies, when teachers create interactive, authentic, and engaging learning process for students (Obdalova & Gural, 2012). For this study we intend to examine the effectiveness of the integrated communicative-cognitive approach to EFL non-linguistic students teaching through the experimental learning.

2.2. Research design

To carry out this study, we developed an experimental teaching model which was implemented in the natural educational settings in the frames of an EFL course for non-linguistic students. The study was designed as a pilot study. The experimental learning was implemented during 6 weeks, from April 2014 through May 2014, at the Faculty of Physics of National Research Tomsk State University, Russia. The teaching model included 1 initial lesson, 4 study lessons, and 1 test lesson (each EFL lesson at university comprises two 45-minute periods). The classes were held once a week and the overall number of academic hours per group was 12. Data were collected with the help of a pre and a posttest oral and written activities, a questionnaire, and oral tasks recorded on the video. Both the pre and the posttest activities were administered in all groups, involved in the experimental study.

It should be mentioned that for this experimental study we chose the topic “Ecotourism”, which was new to all participants, but at the same time correlated with the prescribed topics in the syllabus. It was also selected because it was noted as ‘interesting’ from other suggested topics by the majority of students in the pre-experimental survey. In our opinion, this topic provides rich language input and allows for attracting a variety of linguistic and personal experiences, skills, and knowledge. Thus, language learning was organized in the context of topic “Ecotourism”.

2.3. Participants

The focus group included 60 science faculty students, taking their first and second year EFL courses at the Faculty of Physics (two first-years student groups and two second-year student groups). The sample of subjects was allocated to 2 experimental and 2 control cohorts, which constituted control and experimental groups in the proportion 1:1. We dealt with the learners who take a basic course of training within the frames of the university Bachelor’s program. They take a four-year course of study majoring in Physics and did not have a substantial training in any languages or linguistics per se. The EFL university course aims at developing student skills in communicating on academic and topic-related matters with speakers in English as a lingua franca.

2.4. Description of the teaching framework

The module for this experimental study was designed for the two cohorts of students, aimed at achieving the same objective – improvement of students' linguistic and communicative competence in the content of studying topic "Ecotourism" – by means of different methods, implemented via 2 teaching models. We employed a variety of activity types with pair and group work, collaborative learning, independent learning to engage our students in communicative and cognitive language practice. We compensated the lack of classroom time through the introduction of self-study block designed for students' independent study. A sequence of activities before, during, after and in preparation for the class with the focus on various aspects of language and communication was designed.

2.4.1. The traditional communication-oriented teaching model

In this strategy of teaching predominant concern was on creating conditions for getting message across, though the form focus was not ignored. We call this model "traditional communication-oriented", and it is based on teaching techniques, aimed at language acquisition through topic-related content, inductive way of grammar and language presentation, a lot of conversation in pairs and small groups, and free language practice.

2.4.2. The cognitive-based teaching model

The model for this experimental study was designed in accordance with the lines indicated by Kecskes (2000) for cognitive-based learning as it relates to English as a foreign language. It contains all the elements of the traditional communication-oriented teaching plus the cognitive-based strategy with the focus on meaningful learning and meaningful practice on the basis of comprehending the linguistic knowledge and rules, inference of knowledge, structuring and systematically arranging new knowledge units (vocabulary items, concepts, and ideas), storing and applying them. What is important to note is that in the integrated communicative and cognitive approach teaching is conducted through experimental learning in the topic-related content. It is based on learning through the learner's experience with constructing and appropriating knowledge by means of English.

2.4.3. Model design procedure

The program of experimental teaching comprised 6 sessions (total 12 academic hours), joined together by the topic "Ecotourism", and a set of individual consultations (2 hours weekly) to support students' independent work. According to Langacker (2001), who argues that "optimal language development requires interactive exposure to large quantities of natural speech in context", we created learning environment by means of authentic texts about "Ecotourism" (e.g. the articles by Heather E. Lindsay and Linda Baxter, an audio text from the British Council Magazine – Ecotourism, etc.), pair work, small- group work, and a lot of various exercises, sequenced in accordance with the teaching model. As learning also gains from intensive engagement with small samples of language which learners can internalize, process (comprehend), make their own and use as bases for their own production" (Swan, 2007, p.47), we designed each module as a complex of graded and interconnected activities, micro-tasks (Ellis, 2003), on the basis of the same set of materials, but with a different focus.

Each of the two teaching modules comprised 4 study Units, designed in the form of manuals for the teacher and students. Unit 1 was designed as an introductory unit. It was called "Defining Ecotourism" and besides introducing into the topic it was also aimed at checking students actual knowledge and command of English; it took one session. Unit 2 "Research into the Topic" and Unit 3 "Problem Solving" were assigned as developing units. An important pedagogical aim of Unit 2 became involving students in further exploring the topic for gaining more linguistic experience and consolidating ideas and opinions. It coincided with one session. Unit 3 was designed to help students understand the consequences of mass tourism; develop an appreciation of the environment and importance of personal environment-friendly behaviour. It also took one session. Unit 4 was a finalizing unit, aimed at checking the students' linguistic performance and speech production when applying the acquired knowledge and skills, and at

assessment of students' achievements. It was similar to both experimental and control student groups and took two sessions, because oral tasks (which were recorded) needed time to be accomplished by each student. The common core of both modules is based on the same learning context (topic related texts), providing exposure to information, the target language (topic-related words and phrases, key vocabulary, idioms, collocations, discourse-organizing units), language items (grammar), and the same objectives, related to the improvement of the students' general communicative competence and acquisition of specific topic-related vocabulary.

By design, both types of teaching modules comprised activities on language forms, functions, and skills, and were organized according to the principles of communicative teaching approach, when the learning process is divided into three-phase framework: pre-activity, while activity, and post activity (Willis, 1996, p. 56–57; Millrood, 2001, p.20). Two manuals were designed to support the teacher's and the students' work. Manual *The Teacher's Notes* consists of well-planned and specified (in relation to the objectives, expected answers) linguistic and thematic content, sequence of exercises and tasks, that lead to the final outcomes of each session. Manual *The Student Activity Worksheet* consists of the learning material, instructions what to do with it, the tasks to perform, a Grammar Focus block, a Reflection on the Unit block, and a Home Assignment block, which also included a part, intended for independent self-study, called "Extension by your own activities". It offered students additional Internet resources, picked up by the teacher, through which the students could become more familiarized with the subject, have more individual practice in listening and comprehension, writing, and search for the information they need to prepare for the next session.

Students of both control and experimental groups dealt with the same subject area, target skills, learning material but were involved in different instruction modes. In teaching the control groups we used the traditional communicative methodology, predominantly focused on developing the students' communication skills by means of activities for reading and listening comprehension, learning new words and terms, speaking and writing on the topic and discussing the main problems of the target texts mainly in classroom under the supervision of the teacher. In the experimental groups we enhanced traditional communicative teaching with the cognitive-based orientation and designed additional tasks, centered on the enquiry-based learning, understanding concepts, working on the language items in their connection and authentic usage.

The marked peculiarity of cognitive-based learning design is defined in Kecskes' (2000) conceptual fluency framework. To follow this structure, we introduced into the module activities, aimed at pursuing language transfer and generalization, leading to mastery of the acquired knowledge. To implement this idea we carefully planned the scope (breadth and depth of content) and sequence (the order in which content is introduced and studied) of activities and tasks within the communicative three-phase framework. During the experimental learning the students of the experimental group completed the activities designed to stimulate more intensive mental work when dealing with key vocabulary (in terms of both their effort and the time needed to accomplish the task), concepts and topic-related texts.

Table 1. Table of exercise types.

Predominant types of activities	Communicative type	Cognitive type
Work on grammar	deductively	inductively
Work on vocabulary	key words, word combinations	key words, concepts, word combinations, collocations, idioms
Work on skills	dialogue, discussion, narration, description, listening and reading comprehension, writing	inferencing, associating, grouping, matching, categorizing, summarizing, note-taking, reasoning

2.5. Data collection

The goal of our research is to figure out how to organize learning to foster the development of communication skills and vocabulary acquisition in EFL non-linguistic students. Statistical control for the observed differences was carried out. Quantitative and qualitative data were obtained through survey questionnaires, lexical and communication activities and tasks during the formative pedagogical experiment. In our research, in addition to

asking students to recall what was presented in previous sessions (vocabulary acquisition assessment), we also asked them to produce oral and written speech, using the input material (assessment of communication skills).

We collected data from linguistic and communicative assessment 2 times during the period. The analyses for this study compare outcomes for students in the experimental groups with their counterparts in the control groups at the beginning and immediately after the experimental learning, as well as at the end of each session by means of completing by students the Reflection on the Unit block.

2.6. Data presentation

This study used topic-related vocabulary as the primary units of analysis, as they most appropriately account for comprehension of topic-related texts and ability to express one's idea or opinion on the content-related issue and are used as elements for communication. We measured learning outcomes by using vocabulary assessment activities like 'Spend 3 minutes writing down all of the different words you associate with the word 'tourism' and 'ecotourism'.

Table 2. The number of topic-related words.

Research groups	Before experimental learning (<i>Average</i>)	After experimental learning (<i>Average</i>)
Control Group	7.59	8.98
Experimental Group	6.55	14.59

Apart from assessment of the students' vocabulary acquisition within the topic "Tourism-Ecotourism", we also collected information about feelings and opinions on their learning at the end of each session by means of the Reflection on the Unit block, which included the questions, suggesting either a multiple choice or a free answer, which students completed in pen (e.g. Are you satisfied with what you have learned? Did you enjoy your learning? What was difficult for you? What activities did you like? Have you understood the main text? Can you speak / write in English, using your knowledge of the topic? What have you improved (vocabulary, grammar, reading, speaking, listening, discussion, writing skills, etc.)?

The total scores obtained regarding the basic communication skills, which were marked as an improved area through the experimental learning, for control (CG) and experimental groups (EG) on the basis of students' self-evaluation are presented in Table 3. The communicative skills were engaged with the help of the following tasks: *in speaking* and *discussion* – a) A 3-minute talk on the basis of the reading and listening, using as many topic-related vocabulary, idioms, appropriate speech markers as possible; b) Expressing one's opinion, talking to a partner. Support an opinion with the arguments, explaining "Why". Express agreement or disagreement with other student's attitudes on the issue "The Effects of Tourism"; *in reading* – reading and comprehension of the main text in the Unit; Choose the correct words to fill in the text or topic-related sentences; *in writing* – Complete the sentences (with the focus on vocabulary, with the focus on the target grammar); Explain in your own words in pen what is meant by "environmentally-friendly"; *in listening* – Listen and answer the comprehension questions, listen and complete sentences with the words from audio topic-related text.

Table 3. Total score in communication skills during the experimental learning

Communication skills	CG	EG
Speaking	17	17
Discussion	8	11
Reading	7	17
Listening	6	7
Writing	9	9

An overview of results is based on the data content analysis of the Evaluation Questionnaire, run at the introductory and at the final sessions. It engaged the students of both cohorts in reflecting on their EFL course during the experimental learning. A summary of feedback to the experienced model of teaching and suggestions for any changes are presented in Table 4.

Table 4. A summary of feedback from research participants on each session and the whole module

Type of comment	Content focus
Positive	Activities, processes, materials, atmosphere, ideas, topic, practical tips, use of English, satisfaction with learning
Negative	Lack of time for English classes, lack of equipment, room
Suggestions	Suggestion for change of the instruction timing

3. Discussion

We assessed the two research groups (CG and EG) EFL students' production in terms of their ability to recall topic-related language units and express ideas and opinions on the topic-related issues orally and in pen.

The given data in Table 2 represents the average number of topic-related words, used by the students in each research group to fulfill the task. For assessment we randomly chose a sample of 22 students out of 30 in control and experimental groups. We can see that the number of topic-related words was approximately the same before the study began, 7.59 and 6.35 correspondently in CG and EG. After experimental learning, acquisition of the same category of vocabulary in CG is 8.98, in EG is 14.59, which speaks for a higher gain in topic-related words acquisition in EG by 5.61. Another significant change can be seen when we compare the difference between the number of topic-related words for each group, when we compare the beginning and final stages of the experimental learning: for CG it is 1.36, whereas for EG it is 8.04. The numbers speak for a greater impact of cognitive-communicative teaching model on the learners' topic-related words acquisition.

The data also show that the communicative-oriented model and cognitive-communicative strategy of teaching have achieved approximately the same results in the development of basic communication skills in the students of both control and experimental groups (Table 3). Equal number of subjects (17) in both samples marked speaking as an improved area of their learning. The same situation is with writing and listening. 9 students in each group pointed out that their writing skills developed; 6 students in CG and 7 in EG reported on the development of their listening and comprehension skills. But there is observed difference in relation to the skill of reading. As we can see from Table 3, the number in EG is significantly higher than in CG; and it equals to 17 and 7 correspondently.

We can explain this significant difference in EG students' improvement of reading skills by a greater focus on vocabulary acquisition in the cognitive-communicative teaching model. Students were encouraged to engage a certain amount of thinking while processing the vocabulary; performing cognitive operations (see Table 1). Better retention of topic-related words (Table 2) by EG students had obviously a positive impact on their reading and comprehension of topic-related texts. Although reading skills improved in both samples, comparing the results on the improvement of reading skills in both student samples reveals a significant positive change in EG.

A summary of feedback from research participants on each session and the whole module (Table 4) demonstrates general satisfaction with both models of experimental teaching, as the overwhelming majority of CG and EG students provided positive comments as their feedback on the experienced language course. The factors which were pointed out by the students as negative ones, as we can see, do not depend on the teacher or the designed teaching model, but on the existing educational conditions.

We attribute these positive changes in EG students to the employment of cognitive approach theory into communicative language teaching methodology. In the experimental groups students were encouraged to categorize words, to fill in tables with relevant phrases, which engaged a certain amount of thinking while processing vocabulary. In the control groups students worked on the vocabulary using traditional vocabulary exercises with tasks Odd-one-Out, find equivalents, translate the phrases, guess the meanings, define the word, etc. The results show an increase in the acquisition of the target knowledge in English in EG, thus improving the students' linguistic

and communicative competence. The observed difference in learning effect could be assigned to the use of cognitive-based technology of vocabulary work in the experimental cognitive-communicative teaching model.

4. Conclusion and pedagogical implications

This body of findings illustrates how cognitive approach enhances the possibilities of the purely communicative approach in EFL teaching in the university context. Strictly communicative strategy does not prove ideal for teaching non-linguistic students to communicate in content-related situations, as it is more focused on teaching real-life communication. Besides, as our experimental study demonstrated, communicative-oriented instruction requires more time to explain meanings of new language items, as it is based on using only the target language in the classroom. This is, on the one hand, more time consuming, and on the other hand, causes difficulties for the students whose English is poor, because they do not understand speech wholly in English, and consequently, they do not succeed in their learning. The cognitive approach permits using the mother tongue, which is especially most demanded at the introductory or beginning stage, eliminating obstacles for students' efficient and successful experiences.

The chosen topic, learning materials and the set of activities in both teaching models created a challenging and motivating learning environment, conditions for widening students' linguistic and topic-related knowledge, raised the issues of ethics towards nature, conscious and responsible personal conduct in the environment, but the cognitive-based teaching model helped the teacher to provide a more efficient and rich context for vocabulary increase, thinking and exchanging ideas, engagement of students in investigation of problems. Thus, the designed integrated cognitive-communicative model of teaching created opportunities to enhance communicative EFL teaching. Therefore, it seems to be a good fit for promoting this type of learning.

Implications for EFL methodology from this study suggest that cognitive-based approach to teaching can be combined effectively with a communicative model in designing a motivating, enjoyable and effective learning environment in terms of non-linguistic students' learning outcomes achievement. Vocabulary teaching on the basis of engagement cognitive operations should be given a prominent place, because topic lexicon plays a crucial role for content-related communication. Extensive further research is needed to lay a firm theoretical basis for the cognitive-communicative approach and its effective implementation in the EFL non-linguistic university students teaching setting.

References

- Boers, F., & Lindstromberg, S. (Eds.) (2008). *Cognitive linguistic approaches to teaching vocabulary and phraseology*. Berlin: Mouton de Gruyter.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford: Oxford University Press.
- English for science students: teacher's book, student's book. Obdalova, O. A., Aylazyan, Ye. P., Guarl, S. K., Shabunina, T. A., Eccles, T. A. (2011). *International Journal of Experimental Education*, 12, 33 – 34. www.rae.ru
- Kecskes I. (2010). Formulaic language in English lingua franca. In *Metaphor and Figurative Language: Critical concepts in linguistics*, Hanks Patrick and Rachel Giora (eds.) Oxford/New York: Routledge. (reprint of 2007 paper)
- Kecskes, I. (2014). *Intercultural Pragmatics*. Oxford University Press.
- Kecskes, I., & Papp, T. (2000). *Foreign language and mother tongue*. Hillsdale, NJ: Lawrence Erlbaum.
- Langacker, R. (2001). Cognitive linguistics, language pedagogy, and the English present tense. In Putz, M., Niemeier, S., & Dirven, R. (Eds.). *Applied cognitive linguistics I: Theory and language acquisition*, 3-39. Berlin/New York: Mout de Gruyter.
- Millrood, R. (2001). *Communicative language teaching. Modular course in EFL methodology*. Tambov: Tambov state university.
- Obdalova, O. A., Gural, S. K. (2012). Conceptual framework of a new educational environment design for intercultural competence development, *Language and Culture*, 4 (20), 83 – 96.
- Obdalova, O. A., Minakova L. Yu. (2013). Interconnection of cognitive and communicative aspects in teaching foreign language discourse, *Philological Sciences. Issues of Theory and Practice*, 7 (25), 1, 148 – 153.
- Partnership for 21-st century skills. (2013). *Framework for 21st century learning*. Washington. DC: Partnership for 21-st Century Skills. Retrieved from www.p21.org
- Richards, J.C. (2006). *Communicative language teaching*: Cambridge University Press.
- Swan, M. (2007). Two out of three ain't enough – the essential ingredients of a language course. In Beaven, B. (ed.). *IATEFL Harrogate conference selections*, 44-54. Canterbury, Kent: IATEFL.
- Willis, Jane (1996). *A Framework for Task-Based Learning*. Longman.